

THE DWELLINGS OF THE WORKING CLASSES INFERIOR TO THOSE OF THE PAUPER AND THE PRISONER.

With how many comforts, how many deficiencies, how many virtues, a clean, well-ventilated dwelling is associated, nobody needs to be informed; such is to a family what personal cleanliness is to an individual—a means of health, recreation, rest, and enjoyment. None is it unimportant in a moral sense—

For with the body's purity, the mind acquires a secret, sympathetic aid."

If your business leads you to the dwelling of an artisan—one of the great race whose hands make out wealth, our luxuries, our comforts—where are you likely to find them? In a guttery back street, or stench-abounding alley, you climb a filthy stair; and in a close un-ventilated room, parlour, kitchen, and all, you find the entire family huddled together, for cooking, eating, and sleeping. All the air admitted is through the key-hole, or the broken pane of a window they will neither open nor shut. Neatness is impossible; and with the best housewife her task is the pursuit of cleanliness under difficulties; for how can cleanliness be attained where its first elements, air and water, are with difficulty attainable? The husband driven by the noise, the stench, and the discomfort of his little place, which ought to be his home, is probably at the public-house; the children are of the gutter, and the wife in suds, straw, or saucers. The dilapidated habitations of the rich, abandoned by their advance in the comforts and deficiencies of life, degenerate into abodes of the poor. There is no such thing thought of with all our thinking, of providing the poor with habitations fitted to their wants or means, unless they become chargeable to us as paupers; then indeed an Elizabethan palace rises proudly from some dry and salubrious site. Commissioners, with a thousand a year, see that it is provided with baths, infirmaries, and every necessary of health. Doctors devise plans for its ventilation; the best of clothing, and food, and every thing else is advertised for. But, unless a man is either wealthy or a pauper, no care is taken to give him a decent abode; humble industry may hide its head where it can; as long as it is in working order we take no heed of it; but the minute it is demoralised or depauperised, we have the most elegant model-prisons to correct it, and the most beautiful union-workhouses to jock it up in!—*Bentley's Magazine.*

RAILWAY INDICATOR.

There has just been published in Paris an account of an instrument for indicating the speed of trains, and registering any undue excess of this, it is expected, will act as a wholesome monitor to engine drivers, and lessen the risk of railway travelling by rendering it impossible to escape detection where a dangerous velocity has been attained. This contrivance consists in a governor, such as is commonly used in steam-engines, and set in motion by the customary gearing from one of the axles of the locomotive. To the vertical sliding portion of the governor an index is attached, which passes along a graduated vertical scale, and by the height to which it reaches shows the degree of speed attained; any excess of speed produces a further elevation, and brings into play a second index, which is unconnected with the first, and which on the fall of the governor remains at its maximum height—a standing testimony against the negligence and recklessness of the engineer. As a further precaution, it is arranged that one of the balls of the governor carries a hammer, which strikes a bell, and loudly calls for the attention of the driver. To prevent tampering with the indications of the instrument, the second or tell-tale index is locked up, and the key remains in the possession of some superior officer, who allows at the termination of a journey, can replace it in its original position ready for a new indication. The first index, which only takes a cognizance of speed within the regulated limit, is open to the inspection of all in its neighbourhood; and, if this be neglected or concealed, the bell protests most plainly against the danger and the wrong.

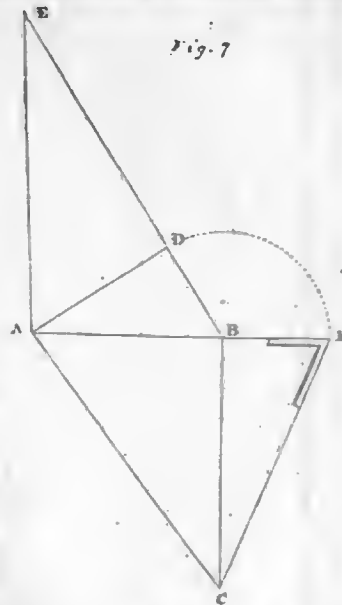
ON THE CONSTRUCTION OF HAND-RAILS OF STAIRS.

BY MR. GEORGE RILEY.
No. II.

18. THE TRIHEDRAL SOLID.—Any figure consisting of three plane faces beside its base, is a trihedral; thus the three faces of a triangular pyramid is a trihedral. We have not space to explain to the utmost extent the properties of all the cases of this solid. In carpentry, the nature of its angles has been long known in the formation of the hipped roof. In masonry, its principles are applied with equal success in the construction of plain oblique arches. Its uses are equally indispensable in the principles of perspective, projection, dialing, &c.

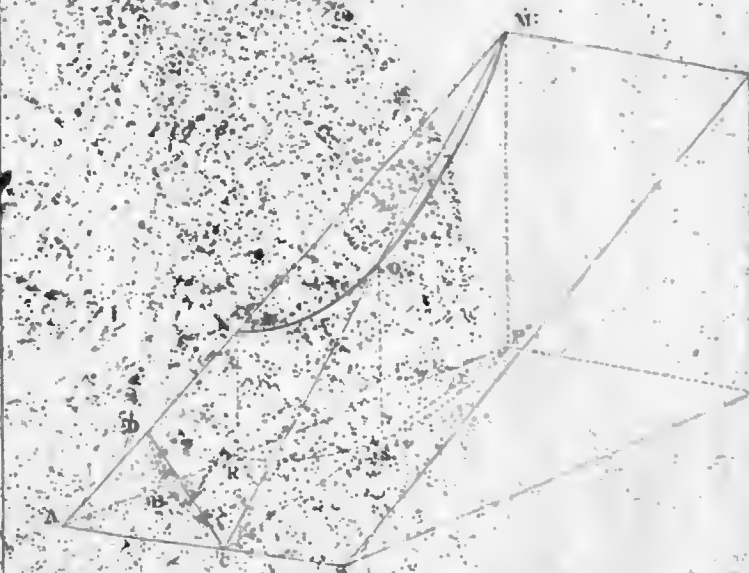
19. In the science of hand-railing, the late Mr. Peter Nicholson has the merit of first adapting its principles, in determining the obliquity of the ordinates, required in tracing out the contour of his face mould; he also with equal ingenuity applied the properties of its solid angles, in determining the position of the face mould upon the surfaces of the plank, out of which the rail was cut.

20. It may be necessary here to observe, that the angles of the trihedral are of two kinds, one of which is that which forms the angle or bevel of any two of its surfaces which constitute the sides of its superficial surfaces; the other is the angle, or bevel, formed by the intersection of any two of the surfaces which constitute the solid itself. This last is sometimes called the dihedral angle, but is more generally known by the name of the solid angle, and is always considered as taken with the legs of the bevel at right angles to the axis which is common to both surfaces. Let the lines A B, H C, and A C (Fig. 7) be the three sides of a right-angled triangle, which forms the base of a trihedral solid. Let the right-angled triangle A B D, represent the development of its vertical side, and the triangles A B E, and B C E, the superficies of the two remaining slanting sides. In this figure the line A E, will require to be equal in length to A C, D B equal to B E, and D E equal to B C; moreover the line A D will require to be square to, or at right angles to D E; B F at right angles to B C, and D F at right angles to A D. Suppose, then, that the planes of the triangles A B D, and B C E, are turned up on the lines A B and B C, as if on hinges, until the lines B D and B E meet each other; and the triangle A D E turned over upon the line A D until the point E falls upon C; we should then have before us the form of a trihedral solid. If this solid be formed in wood, upon the



surfaces of which the letters of reference are marked to correspond with those upon the development of its surfaces, as shown in the figure, by a careful attention to the model, it will be seen that the dihedral, or the solid angle across the axis of the vertical surface, A B D, and the inclined surface A D E will be the angle or bevel B F C, as shown by the development of the triangle B F C. And the lines A E and A C when united will form the axis of intersection of the slanting surface, and the plane of the base of the trihedral.

21. In carrying the use of the trihedral into practice, let us suppose that its vertical face A B D is but a portion of the face of a plane passing vertically through the body of the cylinder, as already described by Article 9, and more particularly delineated in Fig. 8, wherein the slanting surface A D C of the trihedral is conceived to form a portion of a plane cutting obliquely through the body of the cylinder, and the base A B C of the trihedral form, forming a portion of the same plane as that of the base of the cylinder, we shall then perceive the body of our cylinder encircled by the body of the trihedral solid.



22. Now, as the plane of our cutting section is to pass through three points given in position on the surface of the cylinder, which, as we have already observed, must agree with three corresponding points on the line of heights, as laid down on the development of the central line of the rail, and as the slanting

surface of the trihedral and the cutting plane through the cylinder are both in the same plane. It is, therefore, by laying down the development of this plane, that we are enabled to apply the use of the beam-compass in describing the contour of the face-mould with certainty.